

LEONARDO QUEIROZ

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EDUCATION

University of Calgary (UofC), Canada 2022
• **Master of Science – Biomedical Engineering, Specialized in Machine Learning** *(GPA: 4.00 / 4.00)*

Federal Institute of Education, Science and Technology of Ceara (IFCE), Brazil 2014 / 2010 / 2004
• **Bachelor's Degree – Mechatronics Engineering** **(GPA: 3.01 / 4.00)*
• Title of Technologist – Industrial Mechatronics **(GPA: 3.44 / 4.00)*
• Title of Technician – Telecommunications N/A

* The GPAs at the Brazilian institution were evaluated by the World Education Services (WES)

RELEVANT WORK EXPERIENCE

Research Associate – University of Calgary, Calgary/AB, Canada May 2019 – Jan 2022

- Developed and validated a Cascade R-CNN deep learning model to detect masks and estimate respiration rate based on mask colour variation in thermal videos, achieving an accuracy of 91.95%.
- Developed and validated a synthetic dataset with thermal images, where masks are superimposed on unmasked faces. It was applied deep learning algorithms such as RetinaFace and HRNet to a large-scale multimodal dataset (>4 million images).
- Developed and validated a system for estimating respiration rate based on respiratory-related movements (chest/back) in videos in the near-infrared spectrum, achieving an accuracy of up to 99.70%. For this project, the OpenPose deep learning algorithm was used for pose estimation in addition to image processing techniques such as Lucas Kanade Optical-flow method, Butterworth filter and so on.
- Developed and validated several machine learning solutions, including CNNs, kNN, PCA, and SVM for drunkenness detection on thermal face. Performed feature engineering and hyperparameter optimization on CNN using test driven development.
- Proficient with multiple Python ML solutions, libraries and frameworks including scikit-learn, pandas, numpy, Matplotlib, seaborn, scipy, Tensorflow, and Pytorch.
- Collaborated with non-technical stakeholders when developing the software solution.
- Acquire, analyzed, and transformed large, complex videos dataset.
- Supported development of object detection/segmentation (Faster R-CNN / Mask R-CNN) algorithms for PPE detection.
- Supported development of Stroke weakness classification algorithm with pressure sensors.
- Teaching assistant for Foundations of Mechatronics course for more than 60 students with hardware and software content.
- Supervised three summer students on a software/hardware project while maintaining git version control.
- Completed thesis based Masters at U of C, publishing two IEEE conference papers and one poster during my tenure.

Between December 2016 and May 2019 I was learning English and working as a machine operator in the foam and oil and gas pipeline construction industries.

Electrical Maintenance Technologist, Petrobras, Brazil Jan 2016 – Dec 2016

- Performed corrective, preventive and predictive maintenance in Offshore Automation and Instrumentation Systems observing the availability of material, tools and the maintenance history through ERP software (SAP R/3). That included upgrading, calibration and changes to equipment such as control valves, transmitters, pressure switches, flow sensors, thermostats, pumps, and so on.
- Monitor and adjust equipment and process variables through the supervisory system (SCADA) and/or PLC programming, keeping the operation safe and environmentally correct.
- Use specific and complementary technical and operational know-how according to the relevant technical instructions, drawings, standards and legislation at all times with safety regulations and follow the business processes.

Adjunct Professor, Federal University of Ceara (UFC), Brazil Jan 2015 – Aug 2015

- Taught courses in Mathematics and Civil/Chemical/Electrical Engineering curriculums
- Graduate course taught: Fundamentals of Computer Programming and Programming for Engineering, using "C" language.
- Developed curriculum, teaching materials and lesson plan for the courses
- Supervised independent and group projects, laboratory work and hands-on training

LEADERSHIP & EXTRACURRICULAR EXPERIENCE

High School Mentorship Jul 2021 – Aug 2021

2021 Alberta Innovates Highschool Youth Researcher Summer (HYRS) Program (2021)

- Program Mentorship Package – University of Calgary
- Mentored High School students
- Provided peer-advice about research, developing real-world perspective and understanding of the process of research and how methods affect the results.
- Facilitated discussions about the ability to ask appropriate questions in an academic and/or research environment

Project Manager / Academic Advisor Aug 2020 – Apr 2021

Computer, Electrical, and Software Engineering Team Design Course (ENEL 500) – University of Calgary

- Capstone Project – Development of a Stroke Unit Monitoring Control System
- Supervised and advised 6 software engineering students in the engineering project of the ENEL 500 course at the University of Calgary. It was developed a system for remote monitoring of stroke patients using IP cameras, tablet and raspberry PI hardware, applying engineering knowledge to solve a real-life problem.

Summer Student Mentorship Jun – Aug (2019 – 2021)

Schulich School of Engineering – University of Calgary

- Supervised a team of High School and undergraduate students over the summer of 2019-2021 to create a comprehensive knowledge about research and specific applications such as paper analysis, data collection, data pre-processing, machine learning, deep learning, and computer vision
- Mentored High school and undergraduate students to learn about image/video collection in different spectrums, image/video processing, application of algorithms for object detection, object segmentation, subject tracking, classification, among others

Community Outreach Talks

Aug 2020 / Aug 2021

- Lecture on Thermal Imaging for Software Engineering students – University of Calgary (Canada) – August 23th, 2020 – Overview on Thermal imaging explaining the fundamentals of infrared (IR) thermal imaging, the basic properties of IR imaging system and applications.
- Speaker on Multispectral video-based system for breathing rate measurement for the I Symposium of Mathematics in Medicine – Federal Institute of Science and Technology of Ceara (Brazil) and Federal Institute of Science and Technology of São Paulo (Brazil) – August 7th, 2021 – Overview of multispectral video-based systems for measuring breathing rate.

Volunteer

- Studio Bell Jun 2017 – Aug 2017
 - Welcoming, accompanying and assisting visitors to the music museum, in addition to participating in special events during the summer.
- First Evangelical Free Church Jan 2018 – Dec 2019
 - Play, rehearse and assist in creating musical arrangements with keyboard, bass and guitar.

ADDITIONAL TRAINING AND EDUCATION

Courses:

- Neural Networks and Deep Learning (August 2020) – Coursera (25 hours)
 - Topics included: Deep learning, Artificial Neural Networks, Backpropagation, Python Programming, Neural Network Architecture

Books:

- Hands-on Machine Learning with Scikit-Learn, Keras & TensorFlow by Aurélien Géron (In progress)
- Deep Learning with Python by François Chollet (In progress)

SKILLS & INTERESTS

- **Technical Skills:** Proficient in Python, MATLAB and Object oriented programming, Basic proficiency in C, JavaScript, VBA, AutoCAD, SolidWorks and data pipeline.
- **Interpersonal skills:** Ability to work in diverse background groups as a leader and team player. Passionate about technology, transitioning to the field of Data science/Machine Learning with the desire to drive progress and technological advances that bring effective changes to society. Never stop learning, resilient, adapt well to changes and like challenges that explore my full potential.
- **Communication:** Public speaking experience to diverse audiences, which includes lectures, courses and seminars to peers, general public, engineering students and members of academia. Worked as a programming language professor at the Federal University of Ceara, Brazil.
- **Languages:** Portuguese (native), English (fluent), Spanish (comprehend talking)
- **Interests:** Piano, acoustic guitar, books, hiking, biking, movies.